

MEN Mikro Elektronik Nürnberg

The Company – skilled

The Products – reliable

The Applications – demanding

The Customers – international

The Markets – challenging

26 Years MEN Mikro Elektronik Nürnberg

Foundation in 1982

Privately held by three owners

Subsidiaries:

- ◆ MEN Mikro Elektronik S.A., France (1996)
- ◆ MEN Micro Inc., USA (1998)

Worldwide activities

- ◆ Europe
- ◆ America
- ◆ Asia



A Growing Company

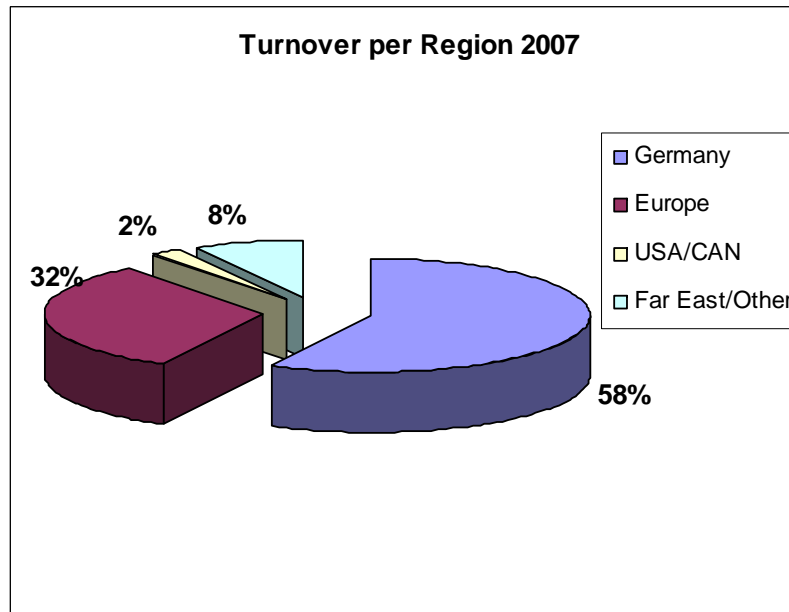
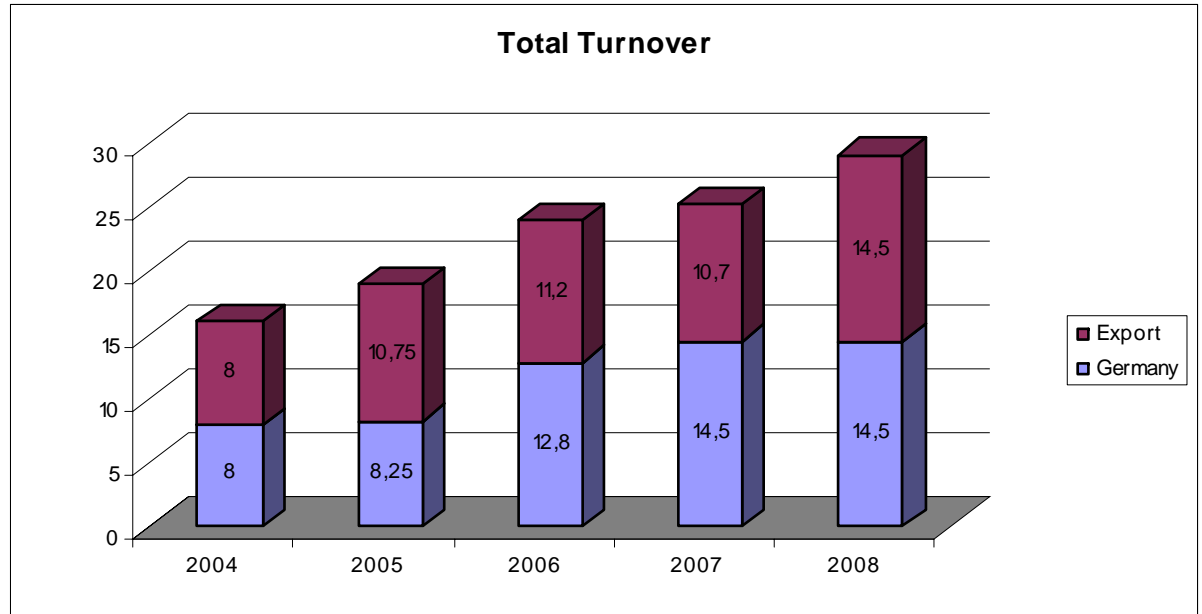
25.2 Mio Euro turnover in 2007

29 Mio Euro expected in 2008

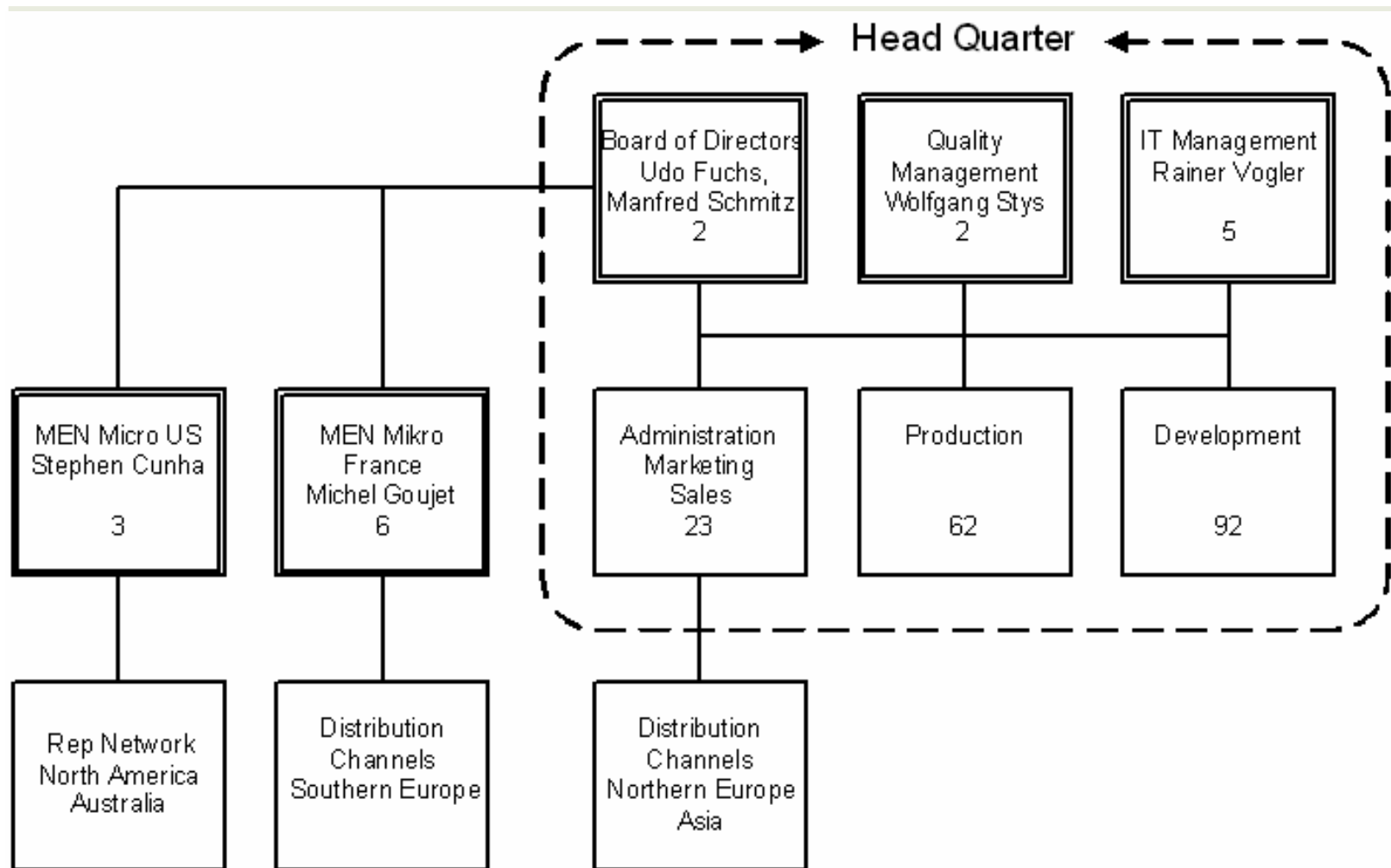
Average growth rates 15% p.a.

Average export rate 50%

Approximately 180 employees in Nuremberg



Organization



Quality Management

Integrated Management System

- ◆ ISO 9001:2000 since 1997
- ◆ ISO 14001:2005 since 2003
- ◆ EN/AS 9100 since 2008
- ◆ IRIS planed for Q1 2009



Member of the UN Global Compact Initiative



As a member of the UN Global Compact Initiative, MEN is committed to follow the principles of human rights, labour, environment and anti-corruption as defined by this organization.

High-Quality Production

Good reasons for production in Europe

- ◆ Highest quality with fully automated production
- ◆ Optimized for product diversity
- ◆ Traceability down to component level

In-line production and test

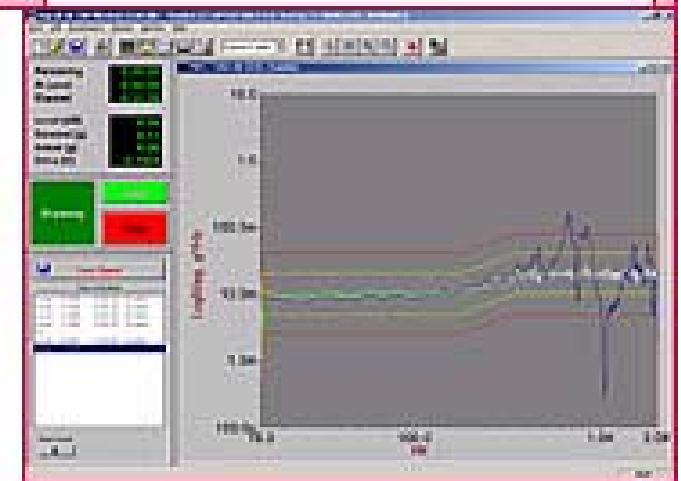
- ◆ Automated screen printing machine
- ◆ AOI - automatic optical inspection
- ◆ Two high-speed multifunctional pick&place machines
- ◆ Vapor-phase reflow soldering
- ◆ In-line function test



Test Lab for Rugged Environments

Pre-qualification at MEN

- ◆ EMC emission
 - Radiated emission disturbances test
 - Contacted emission disturbances test
- ◆ EMC immunity
 - Electrostatic discharge immunity test (ESD)
 - Electromagnetic field immunity test (HF irradiation)
 - Electrical fast transient/burst immunity test (BURST)
 - Conducted disturbances immunity test (HF on line)
- ◆ Magnetic fields
- ◆ Environmental
 - Temperature
 - Humidity
 - Shock, Bump, Vibration



Development

Competence

- ◆ Safety critical designs
- ◆ High speed designs based on Intel Pentium/multi-core and PowerPC
- ◆ FPGA (more than 50 own cores)
- ◆ Real-world I/O
- ◆ Real-time software

Process

- ◆ Adapted V-Model depending on SIL level (DO 254, EN 50129)
- ◆ Requirement tracing
- ◆ Configuration management and project controlling by InStep

Tools

- ◆ Hardware: Mentor tool-chain from circuit diagram to PCB
- ◆ FPGA: Mentor, Altera, Xilinx, Actel including code rule checker and code coverage
- ◆ Mechanics: Inventor for 3D
- ◆ Software: Microsoft, Wind River, Sysgo

Focus Markets

Target markets

- ◆ Ground transportation
- ◆ Avionics
- ◆ Medical
- ◆ Industry

Typical applications

- ◆ Mission critical computers
- ◆ Safety critical systems
- ◆ Highly reliable electronics
- ◆ Systems for harsh environments



Rugged and Reliable Solutions

Rugged for harsh environments

- ◆ -40..+85°C operation temperature
- ◆ Shock, vibration, resonance, drop
- ◆ Humidity, dust, chemical influence (conformal coating)

Reliable

- ◆ For safety-critical applications
- ◆ Or up to 24h operation/up to 30 years

In accordance with norms

- ◆ EN 50155, DO 254....

Qualified

- ◆ Own test lab for prequalification
- ◆ LGA/TÜV for official reports



Industrial-Grade Embedded Products

*We design and manufacture
Industrial embedded computer
boards and systems*

- ◆ Reliable for safety-critical applications
- ◆ Rugged for harsh environments
- ◆ Qualified or screened
- ◆ Flexible with FPGAs for user I/O
- ◆ SBCs and I/O for complete solutions
- ◆ Standard and custom
- ◆ Running Windows, Linux, RTOS



A Wide Standard Product Range

150 different computer boards

- ◆ 72k boards shipped 2007

Computer Boards

- ◆ CompactPCI[®], VMEbus
6U and 3U form factors
- ◆ Computer on Modules
ESM[™] and ESMexpress[®]
- ◆ Custom form factors
- ◆ Intel[®] and PowerPC[®] platforms

I/O

- ◆ CompactPCI[®], VMEbus
- ◆ M-Modules[™], PMC, XMC,
PC•MIP[®]

Completely assembled systems

- ◆ 19" standard systems
- ◆ Display computers
- ◆ Custom housings

BSP, BIOS and driver support

- ◆ Windows[®], Linux, VxWorks[®], QNX[®]



Standard and Custom Solutions

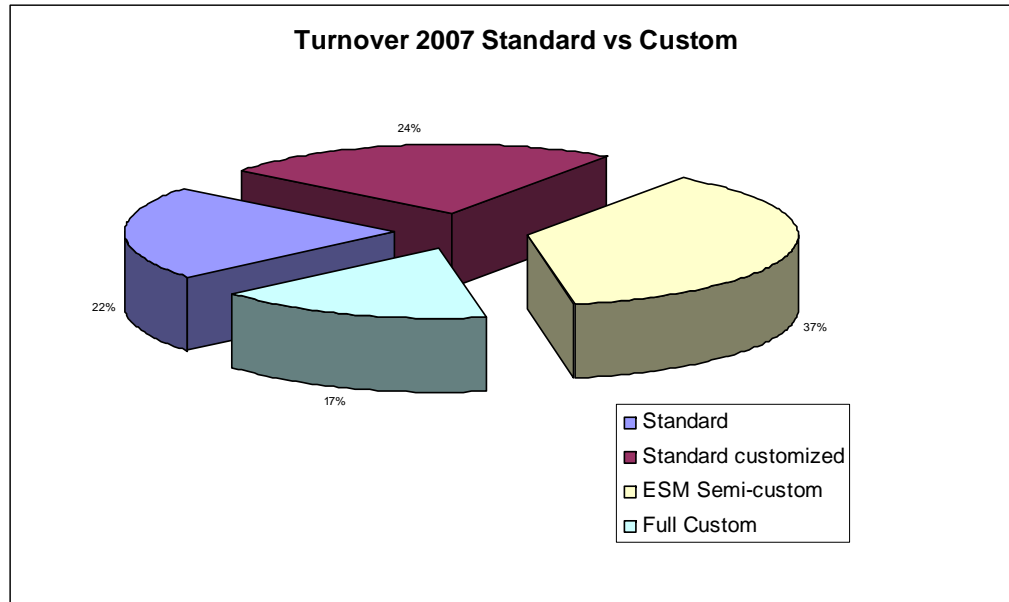
Technologies to save cost and time-to-market

- Computer standards
- COM standards
- I/O mezzanine standards
- FPGA Core Lib based on standards

Standard product portfolio demonstrates know-how

Know-how used to realize application-specific solutions

Custom design may result in new standard product



Locomotive Drive Control



The customer

- ◆ Worldwide leader in building trains

The application

- ◆ Control of all functions of electrical and hydraulic diesel locomotives
E.g. for DB (German Railways)
SNCF (French Railways) etc.

The electronics

- ◆ 3 different computer systems fully compliant with EN 50155
 - 3U VME SBC B12 with PowerPC MPC 823e
 - 3U CPU (PowerPC) and I/O cards for 19" system K-DIREKT

- DIN-rail system K-MODULAR with CPU (MPC 5200) and I/O cards
- ◆ Application based on "4Controls" (Soft PLC) under VxWorks
- ◆ K-MODULAR:
 - Robust low-power metal housing
 - CANopen system bus
 - Hot-plug and self-monitoring



Equipment for Airbus



The customer

- ◆ Rheinmetall Defence is a leading European supplier of army technics

The application

- ◆ Freight load system for Airbus A400M
- ◆ For the drop of goods during flight
- ◆ Minimum 180 airplanes (20 p.a.) with contract until 2050

The electronics

- ◆ Custom development of a Load Master Workstation (based on PowerPC MPC8270)
- ◆ Custom development of a panel controller (based on FPGA) with AFDX PMC
- ◆ DO-254 and DO-178 B Level B
- ◆ Pike-OS



Ventilators for Intensive Care



The customer

- ◆ Hamilton provides low-pressure, high-flow gas valves for medical applications, automation of respiratory support devices etc.

The application

- ◆ Control of different ventilation devices incl. patient monitoring for invasive and non-invasive adult, pediatric and infant therapy

The electronics

- ◆ Standard ESM EM1A with PowerPC MPC5200B under VxWorks
- ◆ Application-specific I/O completely realized in large Cyclone II FPGA

For example graphics, binary I/O, pulse width measurement, quadrature decoder, frequency counter, additional Ethernets and UARTs

- ◆ Custom carrier board for EM1A developed by Hamilton



Textile Machine Control

The customer

- ◆ Saurer Group: World leader of machines for spinning, twisting and embroidery

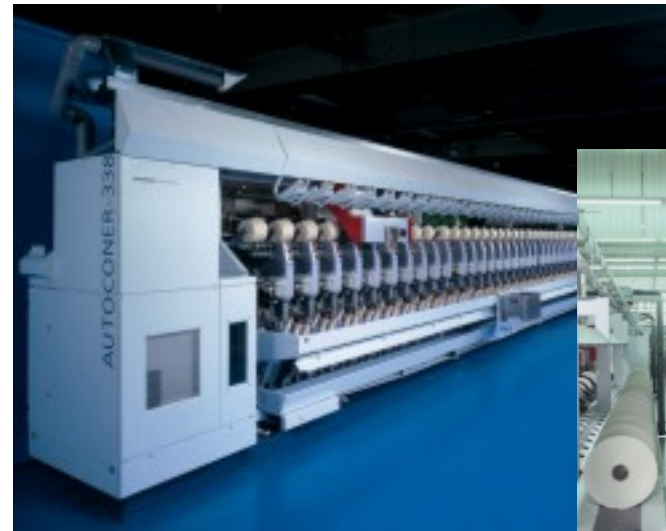
The applications

- ◆ Man-Machine Interfaces for configuration of spinning parameters, acquisition of production and machine data
- ◆ 24 hours operation

The electronics

- ◆ Different MMI versions
- ◆ Semi-custom PowerPC solution based on ESMs - running OS-9 and Linux

- ◆ Integrated TFT display, touch screen, printer and CompactFlash card depending on the version



Tightening System

The customer

- ◆ Bosch Rexroth is a specialist for drive, control and linear motion solutions

The application

- ◆ Modular tightening system for up to 40 channels („screw drivers“)
- ◆ Coordinated by a communication unit

The electronics

- ◆ Custom SBC based on PowerPC MPC5200 under VxWorks
- ◆ FPAG: Arcnet, Ethernet and CAN
- ◆ Carrier board with UARTs, USB and graphics



Nuclear Reactor Control



The customer

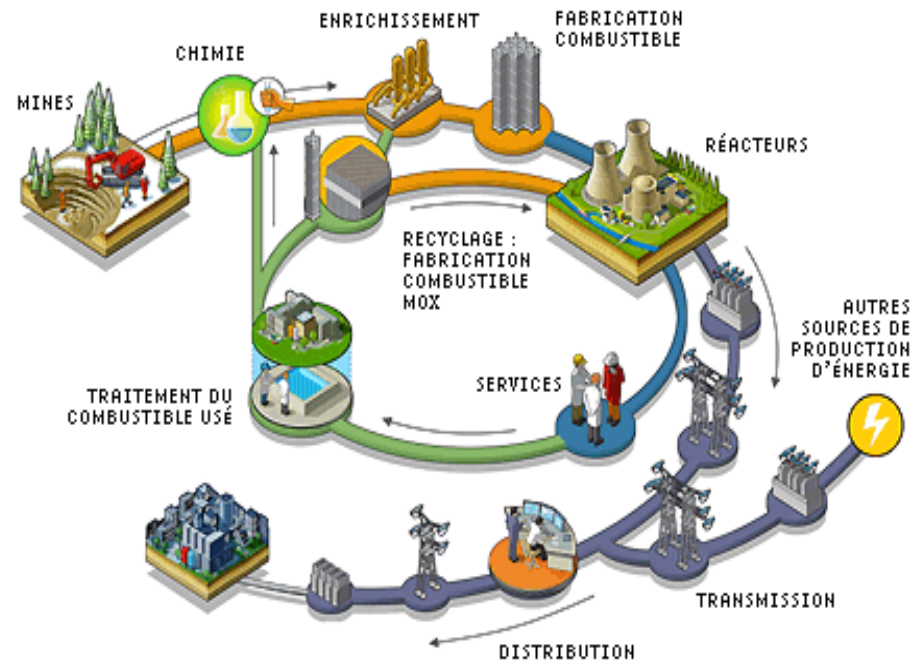
- ◆ French contractor of safety systems for reactors, transportation, and environment

The application

- ◆ Reactor process control with 3 synchronous computers
- ◆ Redundant, connected via fiber-optic network

The electronics

- ◆ 6U VME solution based on PowerPC under QNX
- ◆ VME64 SBC A15
- ◆ Equipped with third-party PMC
- ◆ Large variety of I/O via M-Modules



Control Unit for Measurement Systems



The customer

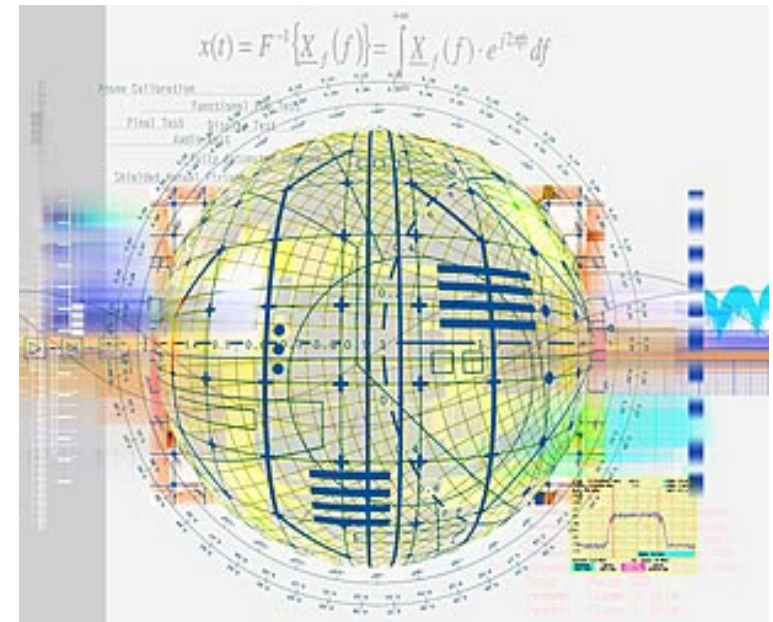
- ◆ Rohde & Schwarz provides test and measurement, information technology and communications solutions

The application

- ◆ New in-house standard hardware platform for a wide variety of different measurement systems

The electronics

- ◆ Custom SBC with Pentium M up to 2GHz
- ◆ 2GB DDR2 SDRAM
- ◆ PCI Express and SATA
- ◆ Designed for rugged environments
 - Memory soldered
 - 40 to +85°C with Celeron M 1GHz



Optical Cross-Connects



Alcatel·Lucent

The customer

- ◆ Alcatel is a leading provider of telecommunication solutions worldwide



The application

- ◆ Control unit for next-generation optical cross-connects



The electronics

- ◆ VME/cPCI Sparc solution under Solaris
replaced by
- ◆ ESM PowerPC solution under Linux
- ◆ EM04A (MPC 8245) and EM03A

Power Automation System



The customer

- ◆ Siemens provides power transmission and distribution equipment for energy-intensive industries

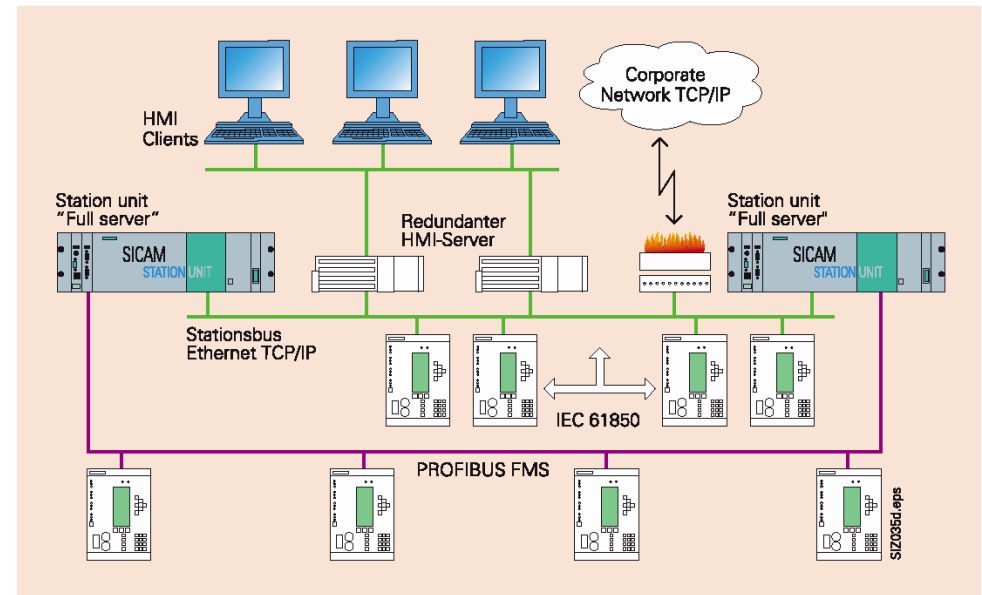


The application

- ◆ Modular station master system SICAM for control of power automation

The electronics

- ◆ Complete 3U CompactPCI system
- ◆ SBC F15 with Intel Core Duo under Windows
- ◆ USB & COM extension card F603
- ◆ Up to 4 M-Modules M77
 - Up to 16 RS232 or RS485
- ◆ Custom switch board for 2 redundant PSUs





Customers from all over the World

Siemens, Germany

- ◆ Automatic train control



Ansaldo/CSEE, France

- ◆ Train supervision



Alcatel, Austria

- ◆ Railway signalling



Baharat, India

- ◆ Heavy electrical engineering

Ruf, Switzerland

- ◆ Passenger information systems

Spirent, USA

- ◆ Telecom test equipment



RFL, United Kingdom

- ◆ Surveillance systems



KTCL, Dubai

- ◆ Oil platforms



Gatsometer, Benelux

- ◆ Speed camera control



MASIC, China

- ◆ Automation of steel mills

Associazione Euratom, Italy

- ◆ Nuclear reactor control

Panasonic, Japan

- ◆ Pick-and-place machines



ONA, Spain



Samsung, Korea

- ◆ Wafer production



Technology Leader in the Embedded Market

Contribution to different standardization bodies (VSO, PICMG)



CAN in Automation



Cooperation with the Nuremberg University of Applied Sciences



Cooperation with industry partners regarding qualification issues

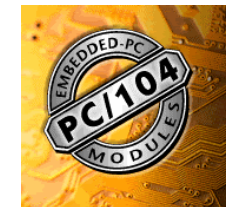


Systems Alliance



Development of two ANSI mezzanine standards (VSO):

- ◆ M-Modules™
- ◆ PC•MIP®



American National Standards Institute

